MONTHLY WEATHER REVIEW.

DECEMBER, 1894.

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INTRODUCTION.

The REVIEW for December, 1894, is based on reports from 3,318 stations occupied by regular and voluntary observers. These reports are classified as follows: 151 reports from Weather Bureau stations; 35 reports from U. S. Army post surgeons; 2,313 monthly reports from State Weather Service and voluntary observers; 32 reports from Canadian stations; 217 reports through the Southern Pacific Railway Company; 546 marine reports through the cooperation of the Hydrographic Office, Navy Department, and "New York Herald Weather Service;" monthly reports from 24 U. S. Life-Saving stations; monthly reports from local services established in all States and Territories; and international simultaneous observations. Trustworthy newspaper extracts and special reports have also been used.

The WEATHER REVIEW for this month has been prepared under the general editorial supervision of Prof. Cleveland Abbe. Unless otherwise specifically noted, the text is written by the Editor, but the statistical tables are furnished by the Division of Records and Meteorological Data, in charge of Mr. A. J. Henry, acting chief of that division.

CHARACTERISTICS OF THE WEATHER FOR DECEMBER, 1894.

The most interesting meteorological features of December were the persistent ridge of high pressure over the Rocky Mountain plateau; the heavy rain on the coast of California, Oregon, and Washington; the unprecedented snowfall on the Sierra and Coast ranges; the great cold wave and freeze that extended over Florida on the 28th and 29th; the severe storm of the 27th on the middle Atlantic and New England coasts.

ATMOSPHERIC PRESSURE.

[*In inches and hundredths.*]

The distribution of mean atmospheric pressure reduced to sea level, as shown by mercurial barometers not reduced to standard gravity and as determined from observations taken daily at 8 a. m. and 8 p. m. (seventy-fifth meridian time), during December, 1894, is shown by isobars on Chart II. That portion of the reduction to standard gravity that depends on latitude is shown by the numbers printed on the right-hand border. This Chart also gives the so-called resultant wind directions for this month, based on the data given in Table IX of this REVIEW.

During the current month of December the highest mean pressures were: 30.32, Idaho Falls; 30.31, Laramie; 30.29, Cheyenne; 30.27, Salt Lake City; 30.26, Denver; 30.25, North Platte.

The lowest mean pressures were: 29.90, Fort Canby; 29.91, Tatoosh Island; 29.94, Port Angeles; 29.96, Seattle; 29.98, Roseburg; 29.99, Marquette. To the northward of this region the lowest pressures at Canadian stations were: 29.98, at Calgary and Port Arthur.

The normal distribution of atmospheric pressure and normal resultant wind direction for the month of December were approximately shown on Chart V of the REVIEW for December, 1893, as computed by Prof. H. A. Hazen, and are not now reproduced. As compared with the normal for December, the mean pressure for the current month was decidedly in excess in New England, Nova Scotia, and Newfoundland, and also in Wyoming, Colorado, and Texas.

The principal excesses were: Sydney, 0.16; St. Johns, 0.15; Halifax and Cheyenne, 0.12; Eastport, 0.10. Pressures were deficient from the western part of Lake Superior along the northern part of the United States as far as the Pacific Ocean and along the coast of Washington and Oregon as far south as Los Angeles, the maximum deficits being: 0.14, Roseburg and Calgary; 0.09, Eureka, and 0.08, Medicine Hat.

As compared with the preceding month of November, the pressures reduced to sea level show a rise in the northeastern and eastern portions of the United States from Maine to North Carolina, the Lake region, the Lower Mississippi Valley, and Northwest. The large rises were: Sydney, 0.15; St. Johns, 0.14; Chatham, Father Point, and Halifax, 0.12; Quebec, 0.11; Eastport, 0.10. The large falls were: Fort Canby, 0.23; Tatoosh Island, 0.21; Portland, Oreg., Roseburg, and Port Angeles, 0.18; Seattle and Eureka, 0.17; Carson City, 0.10.

DIURNAL VARIATIONS.

The systematic periodic diurnal variations of pressure are shown by the hourly means given in Table VI.

AREAS OF HIGH AND LOW PRESSURE.

The following sections give some details as to the phenomena attending the individual areas of high and low pressure. Hitherto it has been customary to enumerate the storm wind signals in connection with special areas of low pressure. During the summer months high winds occur in connection with

areas of low pressure, or so-called storm centers, but during the winter season the northwesterly gales are by reason of their coldness associated with the areas of high pressure. In general, it is proper to consider a strong wind in connection with steep barometric gradients and to postpone any decision as to whether the low pressure on one side, or the high pressure on the other, is especially responsible for the gradient or the wind. As the ordering of wind signals oftentimes depends quite as much on the approach of a high area as of a low the Editor will, for the present, publish these signal orders in connection with the chapter on "High winds," where the connection between the high and low areas will also be mentioned when necessary.

HIGH AREAS.

The principal characteristic of the areas of high pressure during December was the general persistency of their movements southeastward over the Rocky Mountain region into the Gulf States, and thence eastward into the Atlantic Ocean. Only two areas, Nos. IV and IX, passed eastward over New England. On the northeast and southwest sides of the principal paths of high pressure, the low areas have developed, as usual, either in the British Possessions on the north or on the Pacific Coast to the southwest of California.

I.—This was a continuation of high No. XIV of the series for November, and disappeared on the 2d off the south Atlantic coast.

II.—This appeared on the 1st, a. m., in Alberta, and prevailed until the 4th, p. m., over the Rocky Mountain plateau and eastern slope, after which it disappeared in the south Atlantic States.

III.—This was essentially a subdivision of No. II over the Rocky Mountain region, and III*a* was a further subdivision or specialization of the same area, which at that time prevailed from Idaho to North Carolina, while an extensive depression, low No. III, developed in British Columbia, and southerly winds, with rain, prevailed throughout the Pacific States.

IV.—This represented the rising barometer between low areas Nos. II and III; it prevailed over Ontario, northern New England, and Nova Scotia, and was best developed on the 10th, 11th, and 12th, after which it disappeared south of Newfoundland.

V.—On the 7th, a. m., pressure began rising in southern California and the tropical high pressure on the Pacific Ocean pushed northeastward over Arizona and New Mexico, maintaining high pressure in those regions until the 9th, after which it extended northward, and by the 11th, a. m., was central in Utah. This area then broke up into two portions, V*a* and V*b*, and by joining with the following area, VI, became lost in a general ridge of high pressure.

VI.—On the 11th, p. m., an area of high pressure was rapidly approaching Oregon and northern California, and by the 12th, p. m., a ridge of high pressure prevailed from that region southeast to Alabama, while low No. VIII developed on the southwest side, and low No. IX in Alberta. After the 12th two centers, Nos. VI*a* in the west and VI*b* in the east can be distinguished, as this extensive ridge of high pressure divided into two portions, and low No. IX stretched southward between them.

VII.—On the 18th, a. m., the ridge of high pressure from British Columbia to Wyoming began again to increase, while low No. XII to the northward also deepened. During the 18th and 19th this high pressure moved southeastward until the entire Gulf and south Atlantic States were under its influence. During the 20th and 21st it stretched northeast over the Atlantic Coast States, after which it disappeared.

VIII.—This was a small region of high pressure that passed southeastward over Wyoming on the 21st, p. m.

IX.—This was a rather larger area of high pressure that pursued a southeasterly movement from Alberta on the 20th, reaching Nova Scotia on the 24th, and the greater part of its area lay on the northern border of the Daily Weather Map.

X.—On the 22d, p. m., pressure was rising over California, Nevada, and Oregon, and the tropical high pressure rapidly encroached upon the Pacific States. By the 23d, p. m., pressure was highest in Oregon, and by the 24th, a. m., in British Columbia, after which the northward movement of this center ceased and a southward movement began, represented by two areas, X*a* and X*b*. Of these X*a* represents a small region or subordinate center that moved eastward into Manitoba, and disappeared on the 25th, but X*b* represents the principal center which, on the 26th, p. m., was central in Saskatchewan, whence it moved rapidly south, reaching Texas by the 28th, a. m., and thence eastward, reaching Alabama on the 29th, p. m. The central highest pressures, reduced to sea level, were: 25th, a. m., 30.84, temperature —10, Winnemucca. 25th, p. m., 30.76, temperature 8, Winnemucca. 26th, a. m., 31.08, temperature —10, Battleford. 26th, p. m., 31.26, temperature —22, Qu'Appelle. 27th, a. m., 31.14, temperature —16, Qu'Appelle; also 31.14, temperature —24, Bismarck. 27th, p. m., 31.10, temperature —6, Cheyenne. 28th, a. m., 31.00, temperature 6, Abilene. 28th, p. m., 30.82, temperature 32, San Antonio. 29th, a. m., 30.76, temperature 16, Mobile. 29th, p. m., 30.60, temperature 32, Mobile. 30th, a. m., 30.54, temperature 22, Jacksonville. On this latter date the ridge of high pressure, 30.10 or more, extended from British Columbia eastward over Manitoba, southeast to Pennsylvania, and southward over the main portion of the United States. The freezing temperatures that were thus brought to Florida were among the severest on record and are described in another portion of this REVIEW. The Crop Bulletin for the month ending December 31, 1894, states that "the night of Friday, the 28th, was one of the coldest known in the south Atlantic and Gulf States, and in Florida the temperature was about 5° below any previously recorded. Among the minimum temperatures were: Charlotte, 2; Atlanta, 4; Jacksonville, 14; Mobile, 16; Tampa, 18; Jupiter, 24. The following warnings were issued by the Weather Bureau on the morning of the 28th:

Observer, Jupiter, Fla.: Frosts to-night, with temperature about freezing.
Observers, Tampa and Jacksonville, Fla.: Frosts to-night; temperature will fall about 25° in northern portion.
Observer, Jacksonville, and President of the Southern Florida Railroad, Sanford, Fla.: Temperature will fall 16° to 20° by Saturday.
Observer, Jacksonville, Fla.: Fair; colder, with frosts to-night. Western Florida: fair; cold wave.

LOW AREAS.

I.—This was an ill-defined depression in Texas on the 1st, a. m. It then extended northeastward as a narrow trough, over which light rain prevailed, and by the 2d, a. m., the area of slight depression covered the middle Atlantic States and lower Lake region. After this it developed into a well-marked storm that was, on the 3d, a. m., central in Nova Scotia and southern Newfoundland.

II.—This appeared in Alberta on the 3d, p. m., moved eastward along the northern border of our stations, and disappeared east of Newfoundland on the 7th, a. m.

III.—This appeared on the 5th, a. m., in British Columbia; the center moved east into Manitoba, while the depression stretched southeast over the entire Rocky Mountain region. On the 7th, a. m., low No. III was central in North Dakota, while another depression, low No. IV, was near the coast of Oregon. Evidently both of these depressions belonged to an extensive meiobar, reaching from the central portion of the United States northwest to the general meiobar of Alaska, the Aleutian Islands, and Bering Sea. No. III moved eastward over the Lake region and disappeared on the 9th.

IV.—This extensive depression developed rapidly on the 7th off the coast of Oregon, and apparently moved northward

into British Columbia, where it disappeared on the 8th; but on the 9th, a. m., a very similar depression, low No. V, suddenly appeared on the coast of Washington, and, moving northward, similarly disappeared in British Columbia. These areas were accompanied by heavy gales throughout the Pacific States, as also by rain in the lowlands and snow in the highlands. The daily weather map necessarily shows only the south and east portion of the system of winds and pressures. It is plausible and even probable that a first hurricane had moved centrally toward the east-northeast, reaching Washington on the 7th, p. m., and a second on the 9th, a. m.; but as both of these systems of hurricane winds were essentially confined to the lower atmosphere they were soon broken up by the resistances offered by the Rocky Mountains and coast ranges, so that on the following days only a slight and irregular depression appeared in the interior of British Columbia.

V.—On the 9th, a. m., a low area, entirely similar to No. IV, again suddenly appeared on the coast of British Columbia, where it broke up on the same date, so that on the 10th, a. m., only an indefinite depression appeared in Alberta. Both areas, IV and V, must be considered as temporary incidents in the flow of air from the pleiobar off the Pacific coast into the meiobar that prevailed in the interior of North America.

VI and VII.—A depression began to be well-defined on the 9th, a. m., in Texas and represented the southern extremity of the general depression over the interior of the continent. It moved northeastward, dividing into two portions, VI and VII, which were, however, again united on the 12th, and disappeared on the 14th, a. m., over Newfoundland. Severe gales attended its passage over the Lake region on the 11th and 12th.

VIII.—This was an indefinite depression that approached Arizona on the 12th and that prevailed over southern California on the 13th. Nothing more is known of the history of its movements, but the prevalence of high area No. VI, which was at this time central over the Rocky Mountain plateau region, implies that a very considerable depression must have been moving northward off the coast of Lower California. It is during such distributions of pressure as occurred at this time that the dry, northeasterly winds surmount the Mexican plateau and descending upon the Pacific coast of that country produce local storms similar to the "Papagayos" of the Nicaragua coast; some account of these is given by a special correspondent, Mr. G. O. Rogers, in another part of this REVIEW.

IX.—This appeared on the 12th, p. m., in Alberta as one of the numerous special depressions on the northeast side of the general belt of high pressure; it may also be considered as one of the numerous minor whirls that reach down from the upper atmosphere to the earth's surface in the course of their movement around the great polar meiobar. This depression moved southeastward, reaching Iowa on the 15th, and then turned rapidly northeastward over the Lake region, disappeared on the 18th beyond the Gulf of St. Lawrence.

X.—On the 16th, a. m., this low area approached Vancouver Island, but on the 17th had broken up like its predecessors, Nos. VI and VII.

XI.—This appeared on the 17th, a. m., off the coast of Oregon and disappeared in the same region on the 18th. Both X and XI may be regarded as depressions that had a mechanical origin between opposing air currents and that soon died out, because the direction of the whirl, the dryness of the inflowing air, and the deflection due to the Pacific coast mountains all united to oppose any further development.

XII.—This appeared on the 19th, p. m., in Alberta, but can hardly be considered as a continuation of the history of No. XI, although an indefinite area of low pressure evidently extended from the Pacific across British Columbia into the interior of the continent. This area may be traced southward and eastward, passing over the Lake region on the 21st and disappearing south of Newfoundland on the 23d, a. m. High winds prevailed in the Lake region on the 21st and 22d, but with very little rain or snow.

XIII.—Appeared on the 21st, p. m., off the coast of Oregon, and by the 22d, p. m., was apparent only as a slight trough, extending northwest and southeast from British Columbia to South Dakota; in fact, the original depression would be considered as having entirely disappeared were it not believed that such troughs of pressure reduced to sea level often represent merely the trail of a very rapid-moving depression in the upper atmosphere, such that the front of the trough is pushing forward faster than the rear can fill up; this appearance may also be explained as the movement of the locus of interference of the troughs of two waves. On the 23d, p. m., this depression was central in Minnesota, with a steadily falling central pressure. On the 24th, as it passed eastward over the northern portion of the Lake region, the winds and the precipitation increased. By the 25th, p. m., it was central over the Gulf of St. Lawrence, after which it disappeared.

XIV.—High pressure and cold, fair weather now prevailed for several days over the Rocky Mountain plateau, the Mississippi Valley, and Gulf States, but on the 25th, p. m., a cyclonic whirl developed in eastern Texas, on the southern border of the region of cold, northerly winds. This is apparently a case of a whirl that was initiated by the simple confluence of northerly and southerly winds, but the direction of the whirl, the temperature of the northerly and the moisture of the southerly winds conspired to feed and develop the cyclonic whirl, and it rapidly increased in area and intensity. On the 26th, p. m., it was central in South Carolina, and the area of snow or cloud extended northward to Massachusetts, Upper Michigan, and eastern Wisconsin. A severe norther prevailed on the Texas coast and northeast gales on the Atlantic coast. By the 27th, a. m., the lowest pressure (29.26) was central between Philadelphia and Atlantic City, and gales prevailed ovor the Lower Lakes, the Middle and Eastern States. By the 27th, p. m., the lowest pressure was central in northern Maine, and storm winds from 38 to 64 miles prevailed on the Lower Lakes, St. Lawrence Valley, the Middle States, and New England, but the oval contour of the isobars showed the influence of the land and mountains in breaking up the symmetrical circular whirl that had existed on the 27th, a. m. The great development of this storm on the 27th contributed somewhat to the southward flow of cold air which culminated in Florida on the 29th.

The growth of such storms as this depends much upon the amount and location of the snowfall, as is seen from a study of the detailed reports such as the following:

Cincinnati, Ohio.—26th, light, spitting snow began at 12.30 p. m., which gradually turned to heavy, driving, northeast snowstorm. A steady snowfall during the afternoon and continuing into the night. The snow was of a packing character, interrupting traffic and travel. Snowfall up to 8 p. m., 8 inches.

Buffalo, N. Y.—27th, the first real snowstorm set in at about 9 o'clock last night, and still continues. High winds. Thermometer, 18° above zero.

Utica, N. Y.—27th, worst storm for the season within the memory of the oldest inhabitant.

Philadelphia, Pa.—26th, sky filled with thin clouds soon after sunrise and cloudiness increased rapidly, obscuring all sunshine before noon, and sky became very heavy and threatening as the afternoon wore on. The barometer began to fall about noon, and fell with extreme rapidity from 4 p. m., at which hour a furious northeast snowstorm set in. Snow changed to heavy sleet at 8.30 p. m., and sleet changed to rain at 11.50 p. m. About 2.8 inches of snow and sleet fell before the change. About 1.7 inches of snow fell up to 8 p. m., and amount of precipitation had to be estimated at 8 p. m. observation on account of incorrectness of snow-gauge reading due to high wind. 27th, the storm continued all last night, the rain freezing to everything it touched during the early hours and heavily coating with ice telegraph, telephone, and electric-light wires. Immense damage was done to all these poles and wires. No evidence of tornado winds was observable. The weather continued to moderate until this morning, and rain ended at 7.10 a. m. The barometer reached its lowest (29.25) at 8 a. m., making the remarkable fall of 1.15 inches in 20 hours. At 8.20 a. m. it began to rise, being quite as rapid as the fall, and

amounting to 0.82 in the 12 hours ending 8 p. m. The anemometer cups were stopped by ice from 2 to 3.15 a. m., thus interrupting the record.

Atlantic City, N. J.—27th, a storm area nearly central at 8 a. m., with a pressure of 29.26 inches; cloudy nearly all day; high westerly winds; maximum velocity of wind, 47 miles southwest; rain commenced at 8.50 a. m., ending about 9.22 a. m.; snow flurry from 11.28 to 11.40 a. m., and from 3 to 3.14 p. m.; amount of snowfall, trace. All telegraph wires leading from Atlantic City are down, with the exception of one belonging to the Reading Railroad; a. m. weather reports sent by this line 10.20 a. m.; p. m. report delayed, due to wire trouble; a. m. forecast received from Philadelphia at 5.10 p. m., by mail. The tracks of the Pennsylvania Railroad during night and forenoon were covered by high tides; all trains late. The storm has been very severe on telegraph lines.

New York, N. Y.—26th, snow began 5.18 p. m. and ended 11.15 p. m.; sleet began 11 p. m. and continued over midnight. High northeast winds at night. Total snowfall to midnight, 4 inches. 27th, the sleet ended 5.40 a. m.; rain began 5.40 a. m. and ended 12 noon; snow began 12 noon and ended 1.35 p. m. High northeast to northwest winds. Several small sloops reported driven ashore on Long Island and Staten Island coasts. Snowfall to midnight, 4.2 inches.

New Haven, Conn.—27th, the snow which began yesterday, at 7 a. m., changed to sleet during the night, and this continued until 11 a. m. to-day. It was the severest storm of the season. Although the precipitation was not remarkably heavy, the very high wind movement made the storm destructive. Travel on the street railways was carried on only with difficulty. Wind rose to 41 northeast at 5.50 a. m. By dark it had become clear, and after that it became cold, with light wind.

Block Island, R. I.—26th, a storm from the east began 7.05 p. m., and continued. 27th, snow began at 1 a. m. and turned to rain during night. Storm prevailed during the night, accompanied by heavy rain, and ended 5.30 p. m.; maximum velocity, 68 miles per hour, at 2.15 a. m.

Vineyard Haven, Mass.—Violent easterly gale last night; changed to westerly to-day; blowing heavily.

Provincetown, Mass.—27th, a heavy gale, accompanied by a blinding snowstorm, set in last night. At 4 this morning wind hauled to the southeast, and rain fell in torrents.

Boston, Mass.—27th, the wind increased during the night and continued high through the day, shifting from northeast to north, northwest, west, southwest, and south, and back again to southwest and west. It blew in gales from 40 to 50 miles, the latter occurring at 9 a. m., from the northeast. The high wind, with the snow, sleet, and rain, has made this one of the severest storms of the season. Considerable damage resulted from the storm in the vicinity of the station; it was greatest in South Boston, where a church and school building were partly unroofed. Numerous electric and telegraph poles were blown down, wrecking wires and delaying business in many ways. Railroad traffic was much delayed by the drifting snow, falling poles, and wires. No damage to shipping in this vicinity, so far as known at this office.

Lowell, Mass.—Twelve to fourteen inches of snow fell last night; then it changed to hail.

Plymouth, N. H.—27th, first bad storm of the season occurred to-day. Six to twelve inches of snow fell, accompanied by strong east winds.

Nashua, N. H.—Storm to-day the worst of the winter. Twelve inches of snow have fallen, and business is partially suspended.

Portsmouth, N. H.—A severe northeast snowstorm commenced last night and continued up to noon to-day. Railroad trains are delayed from one to two hours, and business is generally suspended on account of the almost impassable condition of the streets. A heavy storm raging at sea, the wind reported as blowing 70 miles an hour.

Concord, N. H.—The snowstorm and gale are very severe. Snow nearly a foot deep, and the snowfall has been succeeded by a fine hail. Temperature from 10° to 20° above zero.

Manchester, N. H.—27th, storm reached here last night at 9.30, and has increased hourly since. Snow about a foot deep, and a fierce, cutting hailstorm now prevails.

Bangor, Me.—27th, a northeast gale and snowstorm reached here early this morning. Snowfall was heavy, and the wind drifted the snow badly. Temperature ranges from 10° to 15° above zero.

Lewiston, Me.—The snowfall was about 10 inches. Temperature about 11° above zero.

Biddeford, Me.—27th, the storm caused a general suspension of business.

Portland, Me.—27th, the storm that commenced last night, at 10 p. m., continued to rage all the morning. The wind reached a velocity of 36 miles at 6.35 a. m. Snow turned to sleet at 10 a. m.; sleet ended at 1.35 p. m. Cloudy weather, with high northeast backing to southwesterly and occasionally to south winds. Amount of snow unmelted, 8.2.

Eastport, Me.—27th, gale began 1.15 a. m.; height, 60 northeast, at 10.10 a. m., and ended 7.30 p. m. Rapidly falling barometer and rising temperature. The storm while it lasted was very severe.

XV.—This was an ill-defined depression moving northward along the coast of California during the 26th, 27th, and 28th, and its existence is, to some extent, inferred from the presence of the remarkable high area which was then central on the eastern slope of the Rocky Mountains.

XVI.—This apparently developed on the 28th off the south Atlantic coast by the flow of cold northerly air southeastward over the Gulf Stream; it moved rapidly northward, and by the 29th, a. m., was central near Nova Scotia, and disappeared on the 29th, p. m., over Newfoundland. Northwesterly gales prevailed along our Atlantic coast, and the center of the storm passed northward between Cape Hatteras and Bermuda.

XVII.—On the 28th, p. m., an area of low pressure moving southeastward approached Lake Superior; it moved slowly eastward, developing somewhat on the 29th, but disappeared on the 30th north of the St. Lawrence.

XVIII.—This depression pursued a path similar to the preceding, moving southeastward toward Lake Superior, where it was central on the 31st, p. m.

MOVEMENTS OF CENTERS.

The following table shows the date and location of the center at the beginning and ending of each area of high or low pressure that has appeared on the U. S. Weather Maps during the month, together with the average daily and hourly velocities. The monthly averages will differ according as we consider each path as a distinct unit, or give equal weight to each day of observation; in the first case the monthly average is taken by paths, in the latter case by days.

Movements of centers of areas of high and low pressure.

Number.	First observed.			Last observed.			Path.		Average velocities.	
	Date.	Lat. N.	Long. W.	Date.	Lat. N.	Long. W.	Length.	Duration.	Daily.	Hourly.
High areas.		°	°		°	°	*Miles.*	*Days.*	*Miles.*	*Miles.*
I	1, a. m.	34	83	2, p. m.	32	80	350	1.5	233	9.7
II	1, a. m.	52	109	4, p. m.	43	112	1,600	3.0	533	22.2
III	2, a. m.	47	113	4, p. m.	32	102	1,400	2.5	560	33.3
IIIa	4, a. m.	33	102	8, p. m.	29	79	2,150	4.5	478	19.9
IV	6, a. m.	50	85	12, a. m.	45	62	1,900	6.0	317	13.2
V	7, a. m.	35	119	11, a. m.	40	108	2,400	4.5	533	26.4
Va	11, a. m.	34	108	11, p. m.	42	109	150	0.5	.....	.....
Vb	11, a. m.	34	108	11, p. m.	34	103	500	0.5	.....	.....
VI	11, p. m.	42	125	12, p. m.	43	104	1,200	1.0	1,200	50.0
VIa	12, p. m.	43	104	16, p. m.	32	80	2,500	4.0	625	26.0
VIb	12, p. m.	43	104	20, a. m.	43	65	5,200	7.5	693	28.9
VII	18, a. m.	46	115	21, p. m.	32	89	2,800	2.5	1,120	46.7
VIII	20, p. m.	43	111	21, p. m.	30	104	550	1.0	550	22.9
IX	20, p. m.	54	112	24, p. m.	44	64	2,550	4.0	638	26.6
X	22, p. m.	37	122	24, a. m.	53	119	1,350	1.5	900	37.4
Xa	24, a. m.	53	119	25, p. m.	45	112	1,050	1.5	700	29.2
Xb	24, a. m.	53	119	30, p. m.	30	80	3,900	6.5	600	25.0
Sums	.....	.....	.....	.....	.....	.....	31,550	53.5	9,680	.....
Mean of 15 paths	.....	.....	.....	.....	.....	.....	.....	.....	645	26.9
Mean of 53.5 days	.....	.....	.....	.....	.....	.....	.....	.....	580	24.2
Low areas.										
I	1, a. m.	33	102	3, a. m.	46	57	2,550	2.0	1,270	53.1
II	3, p. m.	53	112	7, a. m.	49	54	2,800	3.5	800	33.3
III	5, a. m.	53	120	9, a. m.	47	85	2,050	4.0	513	21.4
IV	7, a. m.	45	126	8, p. m.	53	114	850	1.5	647	27.0
V	9, a. m.	48	124	10, a. m.	52	125	350	1.0	350	14.6
VI	9, a. m.	33	98	14, a. m.	50	55	2,850	5.0	570	23.8
VII	10, a. m.	35	102	14, a. m.	50	55	2,850	4.0	713	29.7
VIII	11, p. m.	32	114	13, a. m.	33	116	600	1.5	400	16.7
IX	12, p. m.	55	114	18, a. m.	48	58	4,750	5.5	864	36.0
X	16, a. m.	49	125	17, a. m.	55	104	1,100	1.0	1,100	45.8
XI	17, a. m.	44	126	18, a. m.	43	126	200	1.0	200	8.3
XII	19, p. m.	53	111	23, a. m.	46	53	3,100	3.5	886	36.9
XIII	21, p. m.	46	123	25, p. m.	47	64	3,400	4.0	850	35.4
XIV	25, p. m.	28	98	27, p. m.	46	70	2,150	2.0	1,025	42.7
XV	27, p. m.	40	125	29, p. m.	43	125	300	2.0	150	6.3
XVI	28, a. m.	35	78	29, p. m.	46	61	1,300	1.5	867	36.1
XVII	28, p. m.	49	90	30, p. m.	47	70	950	2.0	475	19.8
XVIII	31, a. m.	47	89	31, p. m.	48	87	100	0.5	.....	.....
Sums	.....	.....	.....	.....	.....	.....	32,200	45.5	11,680	.....
Mean of 17 paths	.....	.....	.....	.....	.....	.....	.....	.....	687	28.6
Mean of 45.5 days	.....	.....	.....	.....	.....	.....	.....	.....	708	29.5